

**WHAT IS CLAIMED IS:**

1. A method for manufacturing a semiconductor apparatus comprising the steps of:

- 5        forming a semiconductor film over a first substrate;  
          crystallizing the semiconductor film by irradiating the semiconductor film with overlapped beam spots of a first laser light and a second laser light to form a crystallized semiconductor film;  
          forming a semiconductor device using the crystallized semiconductor film;  
10        bonding a second substrate over the semiconductor device;  
          removing the first substrate from the semiconductor device;  
          bonding an interposer to the semiconductor device; and  
          removing the second substrate from the semiconductor device.

15        2. A method for manufacturing a semiconductor apparatus comprising the steps of:

- forming a semiconductor film over a first substrate;  
          crystallizing the semiconductor film by irradiating the semiconductor film with overlapped beam spots of a first laser light and a second laser light to form a  
20        crystallized semiconductor film;  
          forming a semiconductor device using the crystallized semiconductor film;  
          bonding a second substrate over the semiconductor device;  
          removing the first substrate from the semiconductor device;  
          bonding an interposer to the semiconductor device;  
25        removing the second substrate from the semiconductor device; and  
          electrically connecting the interposer and the semiconductor device.

3. A method for manufacturing a semiconductor apparatus comprising the steps of:

- 30        forming a semiconductor film over a first substrate;

crystallizing the semiconductor film by irradiating the semiconductor film with overlapped beam spots of a first laser light and a second laser light to form a crystallized semiconductor film;

- forming a semiconductor device using the crystallized semiconductor film;
- 5 bonding a second substrate over the semiconductor device;
- removing the first substrate from the semiconductor device;
- electrically connecting an interposer to the semiconductor device; and
- removing the second substrate from the semiconductor device.

- 10 4. A method for manufacturing a semiconductor apparatus comprising the steps of:

- forming a semiconductor film over an obverse side of a first substrate;
- crystallizing the semiconductor film by irradiating the semiconductor film with overlapped beam spots of a first laser light and a second laser light to form a
- 15 crystallized semiconductor film;
- forming a semiconductor device using the crystallized semiconductor film;
- bonding a second substrate over the semiconductor device;
- bonding a third substrate to a reverse side of the first substrate;
- removing the first substrate and the third substrate from the semiconductor
- 20 device;
- bonding an interposer to the semiconductor device;
- removing the second substrate from the semiconductor device; and
- electrically connecting the interposer to the semiconductor device.

- 25 5. A method for manufacturing a semiconductor apparatus comprising the steps of:

- forming a semiconductor film over a first substrate;
- crystallizing the semiconductor film by irradiating the semiconductor film with overlapped beam spots of a first laser light and a second laser light to form a
- 30 crystallized semiconductor film;

forming a plurality of semiconductor devices using the crystallized semiconductor film;

bonding a second substrate over the plurality of semiconductor devices;

removing the first substrate from the plurality of semiconductor devices;

5 cutting off a semiconductor device from the plurality of semiconductor devices by dicing the second substrate;

bonding an interposer to the semiconductor device; and

removing the second substrate from the semiconductor device.

10 6. A method for manufacturing a semiconductor apparatus comprising the steps of:

forming a semiconductor film over a first substrate;

crystallizing the semiconductor film by irradiating the semiconductor film with overlapped beam spots of a first laser light and a second laser light to form a

15 crystallized semiconductor film;

forming a plurality of semiconductor devices using the crystallized semiconductor film;

bonding a second substrate over the plurality of semiconductor devices;

removing the first substrate from the plurality of semiconductor devices;

20 bonding an interposer to the plurality of semiconductor devices;

cutting off a semiconductor device from the plurality of semiconductor devices by dicing the second substrate and the interposer; and

removing the second substrate from the semiconductor device.

25 7. A method for manufacturing a semiconductor apparatus comprising the steps of:

forming a semiconductor film over a first substrate;

crystallizing the semiconductor film by irradiating the semiconductor film with overlapped beam spots of a first laser light and a second laser light to form a

30 crystallized semiconductor film;

forming a plurality of semiconductor devices using the crystallized semiconductor film;

bonding a second substrate over the plurality of semiconductor devices;

removing the first substrate from the plurality of semiconductor devices;

5 bonding an interposer to the plurality of semiconductor devices;

removing the second substrate from the plurality of semiconductor devices;

and

cutting off a semiconductor device from the plurality of semiconductor devices by dicing the interposer.

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8. The method for manufacturing the semiconductor apparatus according to any one of Claims 1 to 7, wherein a metal film, a metal oxide film and an insulating film are formed between the first substrate and the semiconductor film.

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9. The method for manufacturing the semiconductor apparatus according to any one of Claims 1 to 7, wherein the first laser light is a pulsed laser light and the second laser light is a CW laser light.

10. The method for manufacturing the semiconductor apparatus according to any one of Claims 1 to 7, wherein the first laser light has a wavelength having an absorbent coefficient of at least  $1 \times 10^4 \text{ cm}^{-1}$  for the semiconductor film.

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11. The method for manufacturing the semiconductor apparatus according to Claim 8, wherein the method further comprises a step of crystallizing the metal oxide film by heat-treating.

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12. The method for manufacturing the semiconductor apparatus according to Claim 8, wherein the step of the forming the semiconductor device comprises a step of crystallizing the metal oxide film by heat-treating.

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13. The method for manufacturing the semiconductor apparatus according to Claim 8, wherein the metal oxide film is formed by oxidizing a surface of the metal film.

5           14. The method for manufacturing the semiconductor apparatus according to any one of Claims 1 to 7, wherein the first laser light is a second harmonic laser light.

10           15. The method for manufacturing the semiconductor apparatus according to any one of Claims 1 to 7, wherein the second laser light is a fundamental wave laser light.

15           16. The method for manufacturing the semiconductor apparatus according to any one of Claims 1 to 7, wherein the beam spots of the first laser light and the second laser light are moved relatively to the semiconductor film, and the semiconductor device is formed so as to fit within a width of a beam spot of the second laser light in a vertical direction to a moving direction of the beam spots of the first laser light and the second laser light.

20           17. The method for manufacturing the semiconductor apparatus according to Claim 16, wherein the width of the beam spot of the second laser light is at least 10mm and at most 50mm.

25           18. A semiconductor apparatus using the method for manufacturing a semiconductor apparatus according to any one of Claims 1 to 7.

19. An electric appliance using the semiconductor apparatus according to any one of Claims 1 to 7.